

# Husky<sup>®</sup> 1050A UL-Listed Diaphragm Pumps

313597E

EN

## Model 647016, Evacuation and Transfer Pump

***For use in general fuel transfer applications.***

100 psi (0.7 MPa, 7.0 bar) Maximum Fluid Working Pressure

100 psi (0.7 MPa, 7.0 bar) Maximum Air Input Pressure

## Model 647648, Fuel Dispense Pump

***For use in petroleum product dispense systems in accordance with the United States Flammable and Combustible Liquids Code (NFPA 30) and the Automotive and Marine Service Station Code (NFPA 30a). See page 4 for details.***

50 psi (0.35 MPa, 3.5 bar) Maximum Fluid Working Pressure

50 psi (0.35 MPa, 3.5 bar) Maximum Air Input Pressure

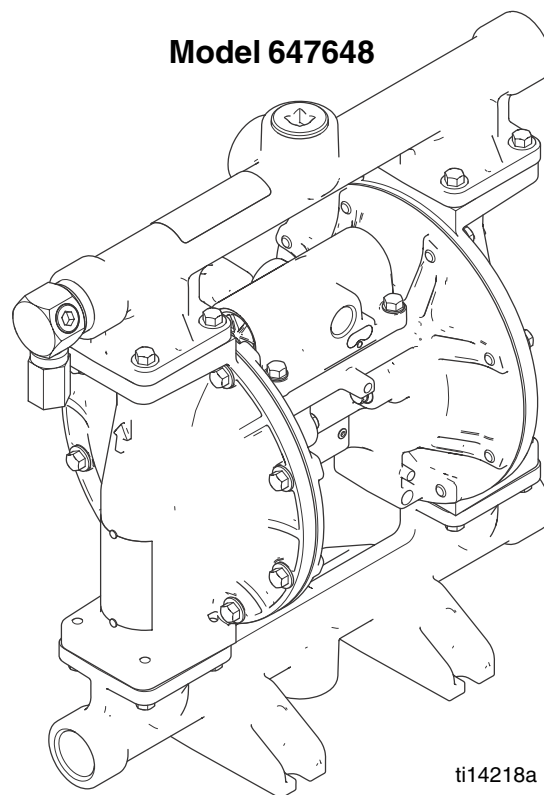
***For professional use only.***



### Important Safety Instructions

Read all warnings and instructions in this manual. Save these instructions.

Model 647648



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This symbol on the nameplate means the product is listed by Underwriters Laboratories Inc. (UL Standard No. 79 for Power-Operated Pumps for Petroleum Product Dispensing systems).



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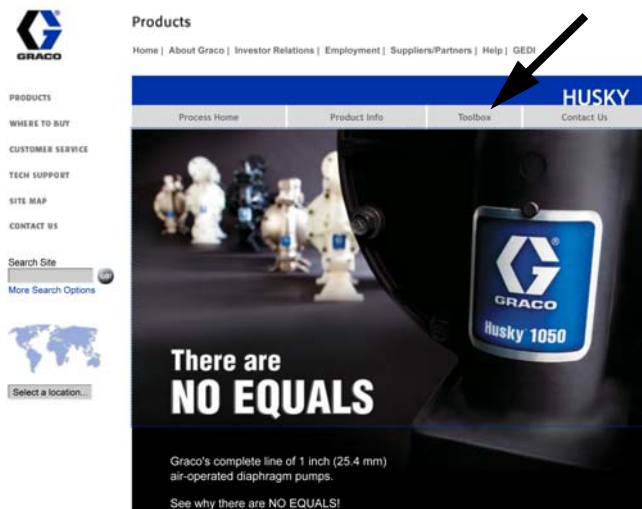
# Related Manual

Manual	Description
313435	Husky 1050 Air-Operated Diaphragm Pump, Repair/Parts

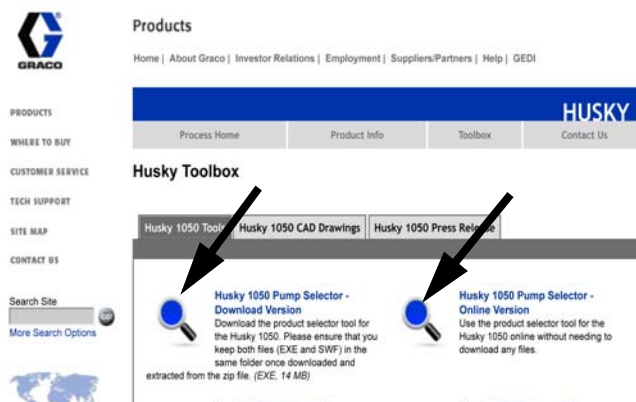
## To Order a New Pump:

**NOTE:** Do not configure and order a pump using only this manual. Work with your Graco distributor or follow the steps below.

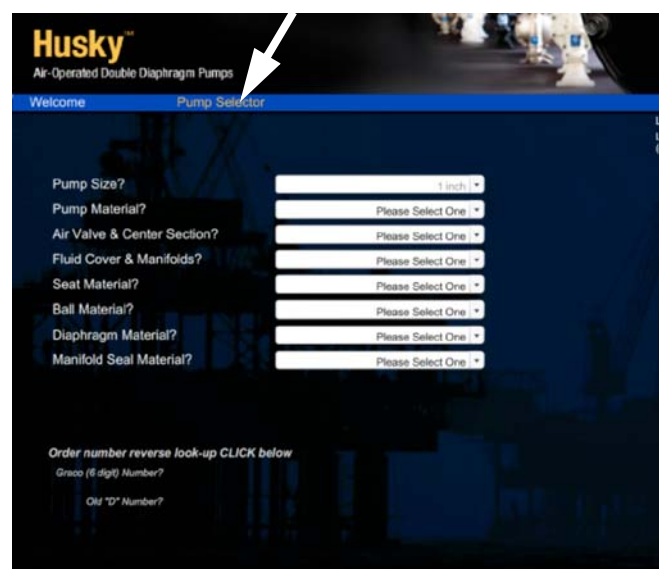
1. Go to [www.gracohusky.com](http://www.gracohusky.com).
2. Click on Toolbox in the gray banner near the top.



3. Click on the Husky 1050 Pump Selector, your choice of either the download version or the online version.



4. Click on Pump Selector in the blue banner. Use the Selector Tool to configure your new pump.



## To Order Parts for Your Existing Pump

1. Check the identification plate (ID) for the 20-digit Configuration Number of your pump.
2. Use the Configuration Number Matrix on the next page to understand which parts are described by each digit.
3. Refer to Parts Manual 313435 for the necessary part numbers.

## Models

Graco Part	Graco Configuration Number	Maximum Working Pressure psi (MPa, bar)
<b>647016</b>	<b>1050A-AU1AA1TPACTP--</b>	100 (0.7, 7.0)
<b>647648</b>	<b>1050A-AU3AA1TPACTP--</b>	50 (0.35, 3.5)

Pump size and material 1050A	Configuration				Fluid Covers and Manifolds A1	Seats TP	Check Balls AC	Diaphragm TP	Manifold O-rings --	
	A	U	1 or 3							A
1 inch ports, 50 gpm, Aluminum	Aluminum Center Section and Air Valve	UL-Listed	1	Fuel Transfer	No Data Monitoring	Aluminum, npt	TPE	Acetal	TPE	None
			3	Fuel Dispense (with pressure relief valve)						

## UL Listing Details

Models 647016 and 647648 are certified per UL 79 for use in pumping gasoline and gasoline/alcohol blends up to 10% ethanol, diesel fuel, fuel oil, and lubricating oil. This certification does not cover oil burner pumps; pumps for engine-powered automotive equipment; or pumps for use in mobile applications, chemical plants, utility plants, petroleum production facilities, and pipeline pump stations, nor does it cover the complete end user installation.

# Warnings

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbol refers to procedure-specific risk. When these symbols appear in the body of this manual, refer back to these warnings. Additional, product-specific warnings may be found throughout the body of this manual where applicable.



## WARNING



### FIRE AND EXPLOSION HAZARD

When flammable fluids are present in the work area, such as gasoline and windshield wiper fluid, be aware that flammable fumes can ignite or explode. To help prevent fire and explosion:

- Use equipment only in well ventilated area.
- Eliminate all ignition sources; such as cigarettes and portable electric lamps.
- Keep work area free of debris, including rags and spilled or open containers of solvent and gasoline.
- Route exhaust away from all sources of ignition. If diaphragm ruptures, fluid may be exhausted with air. See **Air Exhaust Ventilation**, page 10.
- Do not plug or unplug power cords, or turn lights on or off when flammable fumes are present.
- Ground all equipment in the work area. See **Grounding** instructions.
- Use only grounded hoses.
- Hold gun firmly to side of grounded pail when triggering into pail.
- If there is static sparking or you feel a shock, **stop operation immediately**. Do not use equipment until you identify and correct the problem.
- Keep a working fire extinguisher in the work area.



## WARNING



### EQUIPMENT MISUSE HAZARD

Misuse can cause death or serious injury.

- Do not operate the unit when fatigued or under the influence of drugs or alcohol.
- Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See **Technical Data** in all equipment manuals.
- Use fluids and solvents that are compatible with equipment wetted parts. See **Technical Data** in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS from distributor or retailer.
- Do not leave the work area while equipment is energized or under pressure. Turn off all equipment and follow the **Pressure Relief Procedure** in this manual when equipment is not in use.
- Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only.
- Do not alter or modify equipment.
- Use equipment only for its intended purpose. Call your distributor for information.
- Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.
- Do not kink or over bend hoses or use hoses to pull equipment.
- Keep children and animals away from work area.
- Comply with all applicable safety regulations.



### PRESSURIZED EQUIPMENT HAZARD

Fluid from the gun/dispense valve, leaks, or ruptured components can splash in the eyes or on skin and cause serious injury.

- Follow **Pressure Relief Procedure** in this manual, when you stop spraying and before cleaning, checking, or servicing equipment.
- Tighten all fluid connections before operating the equipment.
- Check hoses, tubes, and couplings daily. Replace worn or damaged parts immediately.



### PRESSURIZED ALUMINUM PARTS HAZARD

Use of fluids that are incompatible with aluminum in pressurized equipment can cause serious chemical reaction and equipment rupture. Failure to follow this warning can result in death, serious injury, or property damage.

- Do not use 1,1,1-trichloroethane, methylene chloride, other halogenated hydrocarbon solvents or fluids containing such solvents.
- Many other fluids may contain chemicals that can react with aluminum. Contact your material supplier for compatibility.






### PLASTIC PARTS CLEANING SOLVENT HAZARD

Use only compatible water-based solvents to clean plastic structural or pressure-containing parts. Many solvents can degrade plastic parts and cause them to fail, which could cause serious injury or property damage. See **Technical Data** in this and all other equipment instruction manuals. Read fluid and solvent manufacturer's warnings.



## WARNING

	<p><b>TOXIC FLUID OR FUMES HAZARD</b></p> <p>Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.</p> <ul style="list-style-type: none"> <li>• Read MSDS's to know the specific hazards of the fluids you are using.</li> <li>• Route exhaust away from work area. If diaphragm ruptures, fluid may be exhausted with air.</li> <li>• Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.</li> </ul>
	<p><b>BURN HAZARD</b></p> <p>Equipment surfaces and fluid that's heated can become very hot during operation. To avoid severe burns:</p> <ul style="list-style-type: none"> <li>• Do not touch hot fluid or equipment.</li> </ul>
	<p><b>PERSONAL PROTECTIVE EQUIPMENT</b></p> <p>You must wear appropriate protective equipment when operating, servicing, or when in the operating area of the equipment to help protect you from serious injury, including eye injury, inhalation of toxic fumes, burns, and hearing loss. This equipment includes but is not limited to:</p> <ul style="list-style-type: none"> <li>• Clothing and respirator as recommended by the fluid and solvent manufacturer</li> <li>• Protective eyewear, gloves, and hearing protection</li> </ul>

# Installation

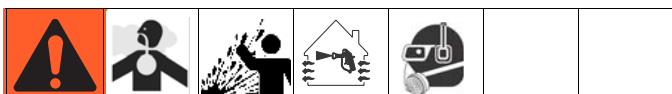
## General Information

- The Typical Installations shown in FIG. 3 through FIG. 5 are only guides for selecting and installing system components. Contact your Graco distributor for assistance in planning a system to suit your needs.
- Installation and use must be in accordance with the Flammable and Combustible Liquids Code (NFPA 30) and Automotive and Marine Service Station Code (NFPA 30a) and must comply with all local, state, and federal codes.
- All pipe joints must be made tight with UL listed gasoline-resistant pipe compound.

## Tighten Fasteners Before Setup

Before using the pump for the first time, check and retorquer all external fasteners. Follow **Torque Instructions**, page 18.

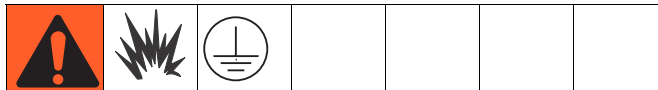
## Mounting



- The pump exhaust air may contain contaminants. Ventilate to a remote area. See **Air Exhaust Ventilation** on page 10.
- Never move or lift a pump under pressure. If dropped, the fluid section may rupture. Always follow the **Pressure Relief Procedure** on page 15 before moving or lifting the pump.

2. For all mountings, be sure the pump is bolted directly to the mounting surface.
3. For ease of operation and service, mount the pump so the air valve, air inlet, fluid inlet and fluid outlet ports are easily accessible.
4. Rubber Foot Mounting Kit 236452 is available to reduce noise and vibration during operation.

## Grounding



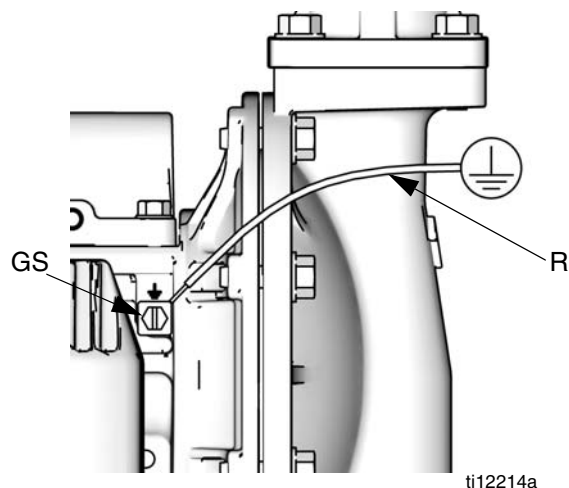
This pump must be electrically grounded using the grounding conductor provided. Improper grounding can cause hazardous operation.

The equipment must be grounded. Grounding reduces the risk of static and electric shock by providing an escape wire for the electrical current due to static build up or in the event of a short circuit.

**Pump:** See FIG. 1. Loosen the grounding screw (GS). Insert one end of a 12 ga. minimum ground wire (R) behind the grounding screw and tighten the screw securely. Connect the clamp end of the ground wire to a true earth ground. A ground wire and clamp, Part 238909, is available from Graco.

1. Be sure the mounting surface can support the weight of the pump, hoses, and accessories, as well as the stress caused during operation.





**FIG. 1. Ground screw and wire**

**Air and fluid hoses:** Use only grounded hoses with a maximum of 500 ft (150 m) combined hose length to ensure grounding continuity.

**Air compressor:** Follow manufacturer's recommendations.

**Fluid supply container:** Follow local code.

**Solvent pails used when flushing:** Follow local code. Use only conductive metal pails, placed on a grounded surface. Do not place the pail on a nonconductive surface, such as paper or cardboard, which interrupts grounding continuity.

**Suction device nozzle:** Bond to metal container from which it is suctioning by firm metal-to-metal contact to a properly grounded supply hose and pump.

**Piping, valves, and fittings:** Use only electrically conductive materials. Bond and ground per code.

Check your system electrical continuity after the initial installation, and then set up a regular schedule for checking continuity to be sure proper grounding is maintained.

## Air Line

Install the air line accessories as shown in FIG. 3 through FIG. 5. Mount these accessories on the wall or on a bracket. Be sure the air line supplying the accessories is grounded.

1. Install an air regulator (C) and gauge to control the fluid pressure. Locate it close to the pump.
2. Locate a bleed-type master air valve (B) close to the pump and use it to relieve trapped air. Be sure the valve is easily accessible from the pump and located downstream from the regulator.

Trapped air can cause the pump to cycle unexpectedly, which could result in serious injury from splashing.						

3. Locate another master air valve (E) upstream from all air line accessories and use it to isolate them during cleaning and repair.
4. An air line filter (F) removes harmful dirt and moisture from the compressed air supply.
5. Install a grounded, flexible air hose (A) between the accessories and the 1/2 npt(f) pump air inlet (D). Use a minimum 3/8 in. (10 mm) ID air hose.

## Air Exhaust Ventilation



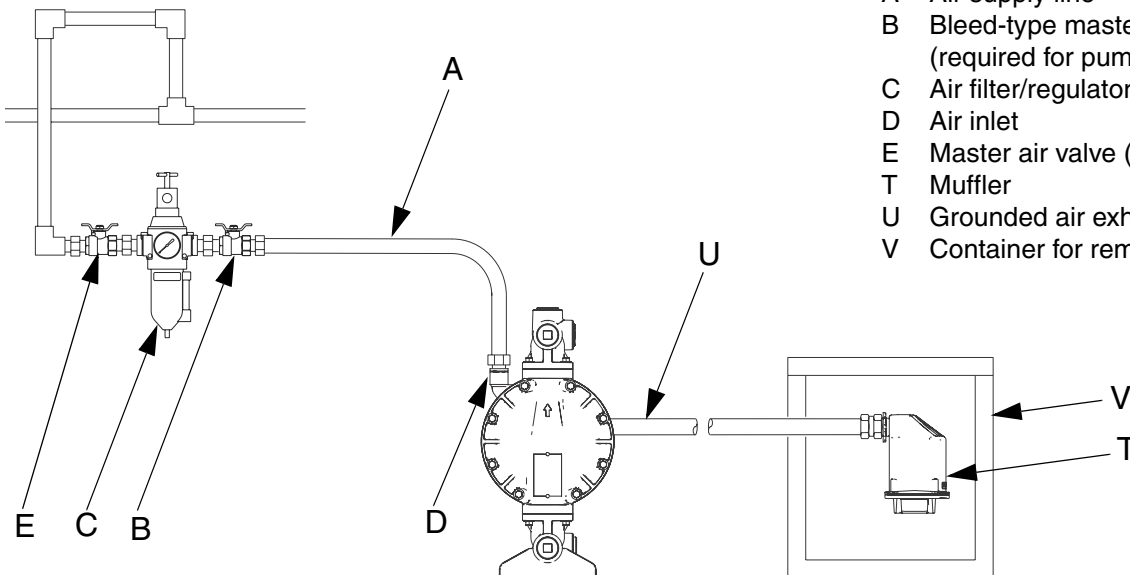
Be sure to read and follow the **TOXIC FLUID OR FUMES HAZARD** warnings, page 7, and **FIRE AND EXPLOSION HAZARD** warnings, page 5, before operating this pump. You must vent the exhaust away from people, animals, food handling areas, and all sources of ignition when pumping flammable or hazardous fluids. Vent in accordance with local codes, or in the absence of local codes, an industry or nationally recognized code having jurisdiction over the specific installation.

The air exhaust port is 3/4 npt(f). Do not restrict the air exhaust port. Excessive exhaust restriction can cause erratic pump operation.

1. Remove the muffler (T) from the pump air exhaust port.
2. Install a grounded air exhaust hose (U) and connect the muffler (T) to the other end of the hose. The minimum size for the air exhaust hose is 3/4 in. (19 mm) ID. If a hose longer than 15 ft (4.57 m) is required, use a larger diameter hose. Avoid sharp bends or kinks in the hose.
3. Place a container at the end of the air exhaust line to catch fluid in case a diaphragm ruptures. Locate the container away from all sources of ignition, including pilot lights and waste materials. If the diaphragm ruptures, the fluid being pumped will exhaust with the air.

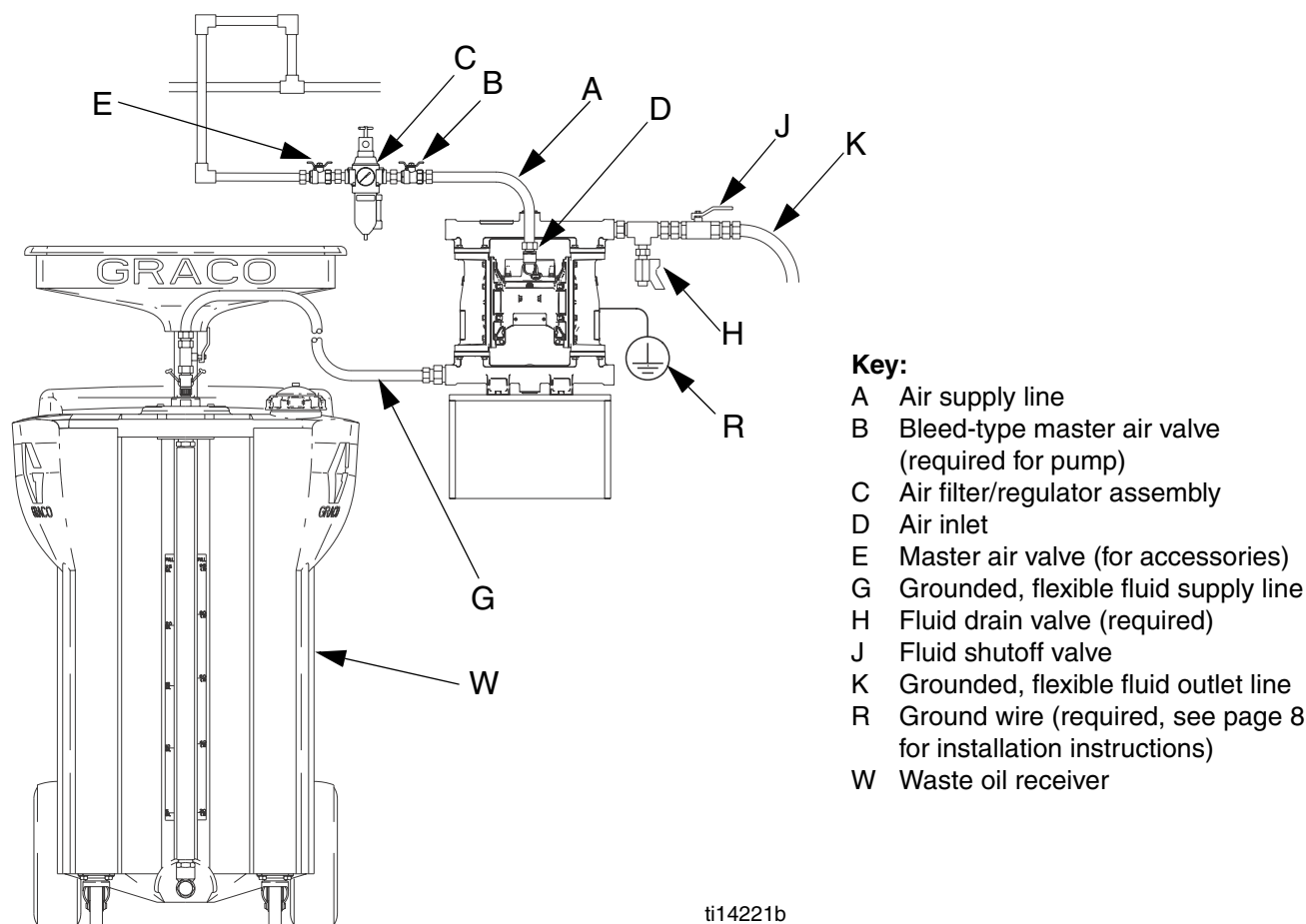
### Key:

- A Air supply line
- B Bleed-type master air valve (required for pump)
- C Air filter/regulator assembly
- D Air inlet
- E Master air valve (for accessories)
- T Muffler
- U Grounded air exhaust hose
- V Container for remote air exhaust



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**FIG. 2. Vent exhaust air**

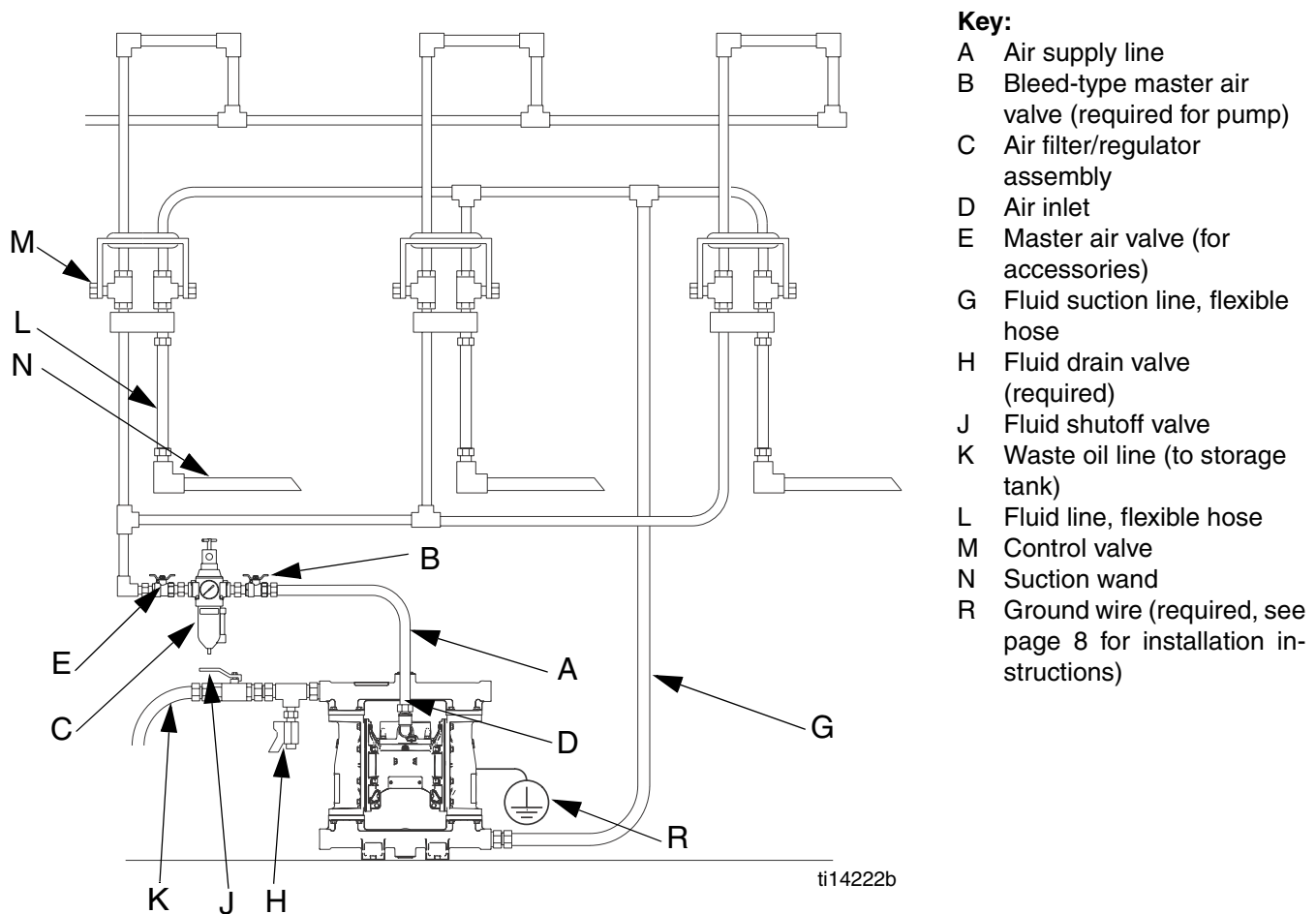


**FIG. 3. Waste oil or general fluid transfer, typical installation**

## Fluid Supply Line

See FIG. 3 through FIG. 5, pages 11 through 13.

1. Use grounded, flexible fluid supply lines (G). See **Grounding**, page 8.
2. If the inlet fluid pressure to the pump is more than 25% of the outlet working pressure, the ball check valves will not close fast enough, resulting in inefficient pump operation. Excessive inlet fluid pressure also will shorten diaphragm life. Approximately 3 - 5 psi (0.02 - 0.03 MPa, 0.21-0.34 bar) should be adequate for most materials.
3. For maximum suction lift (wet and dry), see **Technical Data**, page 21. For best results, always install the pump as close as possible to the material source.
4. For a Waste Oil Receiver Evacuation System, connect an appropriate suction hose (G) between the pump fluid inlet and the waste oil receiver. See FIG. 3.
5. For a Gear Oil Evacuation System, install a control valve (M), flexible hose (L), and an appropriate wand (N) in each service bay and connect to the fluid suction line (G). See FIG. 4, page 12.
6. For a Fuel Dispense System, connect a fluid supply line (G) to the fluid inlet. See FIG. 5, page 13.



**FIG. 4. Gear oil evacuation, typical installation**

## Fluid Outlet Line

See FIG. 3 through FIG. 5, pages 11 through 13.

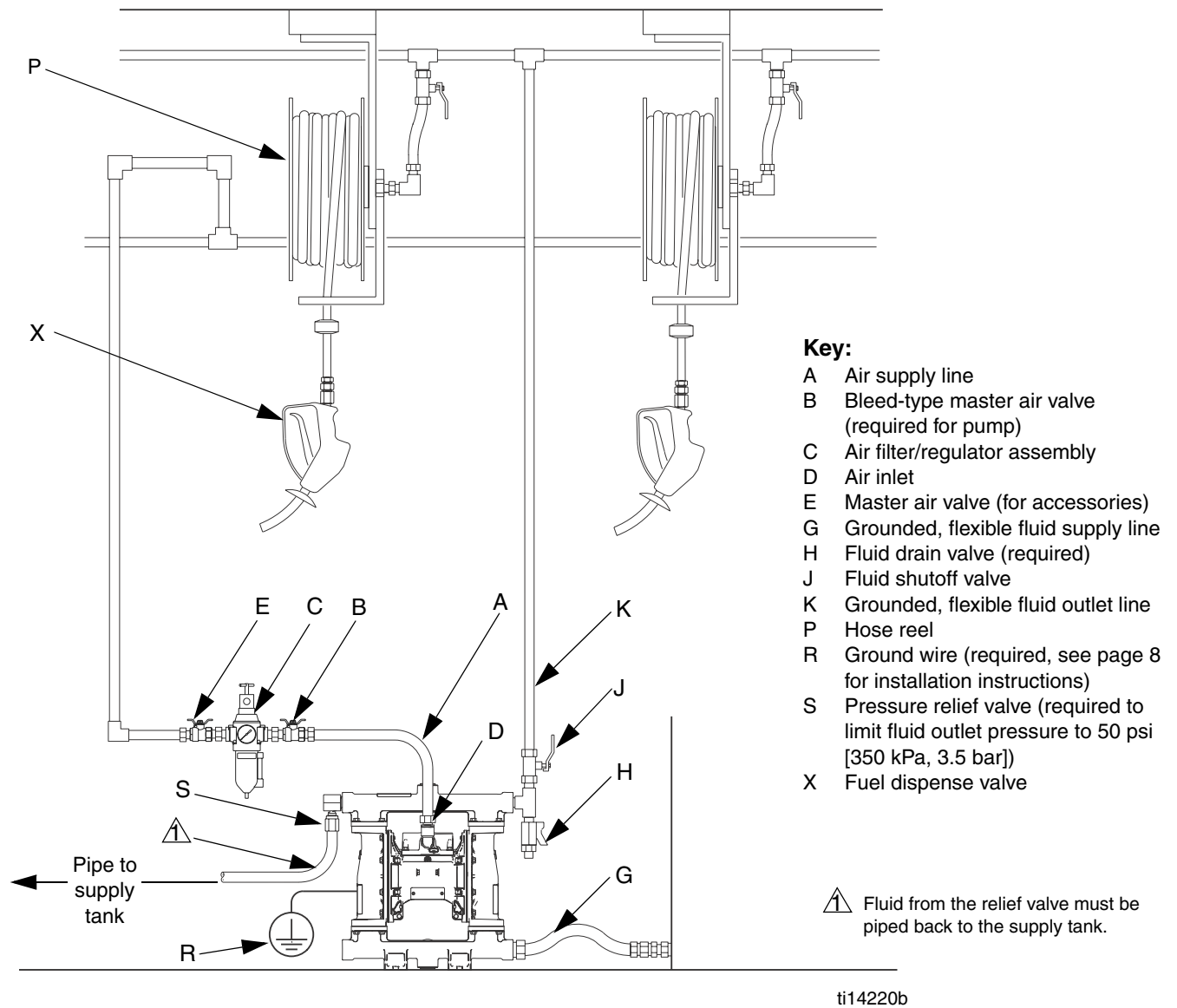
1. Use grounded fluid hoses (G, K). See **Grounding**, page 8.
2. The pump fluid outlet is 1 in. npt(f). Screw the fluid fitting into the pump outlet securely.
3. A fluid drain valve (H) is required in your system to relieve pressure in the hose and dispense valve. Install the valve close to the pump fluid outlet.

4. Install a shutoff valve (J) in the fluid outlet line.

## Fluid Inlet and Outlet Ports

**NOTE:** Remove and reverse the manifold(s) to change the orientation of inlet or outlet port(s). Follow **Torque Instructions**, page 18.

The fluid inlet and outlet manifolds each have four 1 in. npt(f) threaded ports. Close off the unused ports, using the supplied plugs.



**FIG. 5. Fuel dispense, typical installation**

## Fluid Pressure Relief Valve

### Fuel Dispense Systems (Model 647648)



Fuel dispense model 647648 requires a pressure relief valve (S), Graco part 24B910, which is supplied with the pump, to prevent fluid pressure from exceeding 50 psi (350 kPa, 3.5 bar). See FIG. 5, page 13.

Recommended air operating pressure is 40 psi (280 kPa, 2.8 bar) or less. As the air inlet pressure approaches 50 psi (350 kPa, 3.5 bar), the relief valve will open and vent fluid. Vented fluid must be routed to a container in a non-hazardous location.

### Evacuation and Transfer Systems (Model 647016)

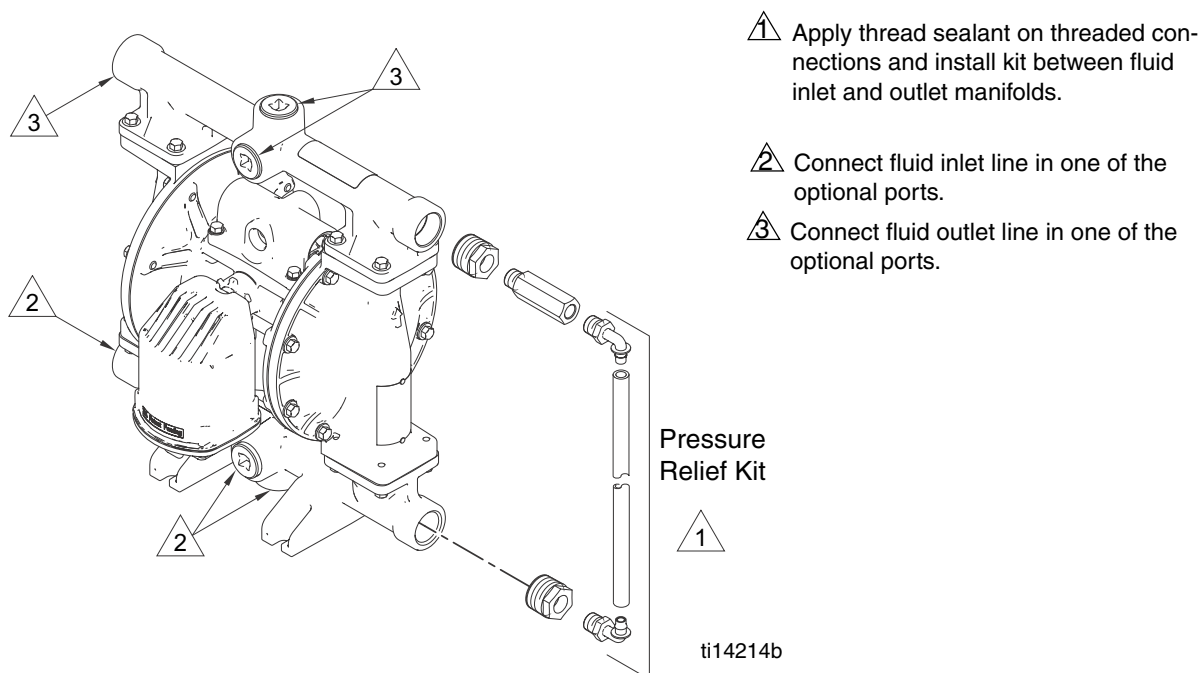


Some evacuation and transfer systems may require installation of a pressure relief valve at the pump outlet to prevent overpressurization and rupture of the pump or hose. Graco Kit 238428 is available. See FIG. 6. Relief pressure is between 150 and 180 psi (1.03 MPa-1.24 MPa, 10.3-12.4 bar).

**This kit is not for use in fuel dispense applications**, which require pressure relief at 50 psi (350 kPa, 3.5 bar). Order a fuel dispense pump (Model 647648), which is equipped with pressure relief valve 24B910. See Warning above.

Thermal expansion of fluid in the outlet line can cause overpressurization. Thermal expansion can occur when using long fluid lines exposed to sunlight or ambient heat, or when pumping from a cool to a warm area (for example, from an underground tank).





Overpressurization also can occur if the Husky pump is used to feed fluid to a piston pump, and the intake valve of the piston pump does not close, causing fluid to back up in the outlet line.



**FIG. 6. Optional Fluid Pressure Relief Kit 238428, for Model 647016 (not acceptable for fuel dispense application)**

# Operation

## Pressure Relief Procedure

						
<p>Trapped air can cause the pump to cycle unexpectedly, which could result in serious injury from splashing.</p>						

1. Shut off the air supply to the pump.
2. Open the dispensing valve (if used).
3. Open the fluid drain valve to relieve fluid pressure, having a waste container ready to catch the drainage.

## Flush the Pump Before First Use

The pump was tested in water. If water could contaminate the fluid you are pumping, flush the pump thoroughly with a compatible solvent. See **Flushing and Storage**, page 17.

## Tighten Fasteners Before Setup

Before using the pump for the first time, check and retorque all external fasteners. Follow **Torque Instructions**, page 18. After the first day of operation, retorque the fasteners.

## Starting and Adjusting the Pump

1. Be sure the pump is properly grounded. Refer to **Grounding** on page 8.
2. Check fittings to be sure they are tight. Use a compatible liquid thread sealant on male threads. Tighten the fluid inlet and outlet fittings securely.

**NOTE:** If fluid inlet pressure to the pump is more than 25% of outlet working pressure, the ball check valves will not close fast enough, resulting in inefficient pump operation.

## Waste Oil Receiver Evacuation Systems or General Fluid Transfer Applications

See FIG. 3.

1. Close the pump air regulator (C) and the bleed-type master air valves (B, E).
2. Connect the pump suction hose (G) to the pump fluid inlet. Attach a fluid quick coupler to the other end of the hose, then connect the coupler to the outlet fitting of the waste oil receiver.
3. Place the end of the fluid hose into an appropriate container.
4. Close the fluid drain valve (H). Open the fluid shutoff valve (J).
5. Connect the air supply line to the pump air inlet (D).
6. Open the bleed-type master air valves (B, E).
7. Slowly increase air pressure with the air regulator (C) until the pump starts to cycle. Allow the pump to cycle slowly until all air is pushed out of the lines and the pump is primed.

**NOTE:** Use lowest possible air pressure to prime, just enough to cycle the pump. If the pump does not prime as expected, turn air pressure **DOWN**.

### NOTICE

**When replacing Husky 1040s:** The Husky 1050 operates more efficiently than did the 1040. **Reduce** air inlet pressure by approximately **20 percent** to maintain an equivalent fluid output.



## Gear Oil Evacuation Systems

See FIG. 4.

1. Close the pump air regulator (C) and the bleed-type master air valves (B, E).
2. Attach an appropriate wand to the suction hose. Place the wand in the differential or fluid to be pumped.
3. Place the end of the fluid hose into an appropriate container.
4. Close the fluid drain valve (H). Open the fluid shutoff valve (J).
5. Connect the air supply line to the pump air inlet (D).
6. Open the bleed-type master air valves (B, E).
7. Set the air regulator (C) to about 50 psi (350 kPa, 3.5 bar).
8. Pull the control valve handle (M) down to start the pump.

**NOTE:** Adjust the air regulator (C). Allow the pump to cycle slowly until all air is pushed out of the lines and the pump is primed. Use lowest possible air pressure to prime, just enough to cycle the pump. If the pump does not prime as expected, turn air pressure **DOWN**.

### NOTICE

**When replacing Husky 1040s:** The Husky 1050 operates more efficiently than did the 1040. **Reduce** air inlet pressure by approximately **20 percent** to maintain an equivalent fluid output.

9. Push the control valve handle (M) up when finished. Place the wand in the holder on the control valve.

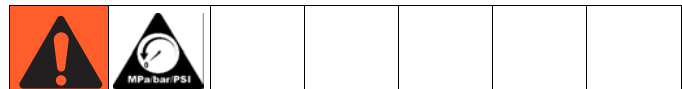
**NOTE:** Be sure the control valve handle is closed when evacuation is completed. Failure to close it may prevent other service bays from developing full suction.

## Fuel Dispense Systems

See FIG. 5.

1. Close the pump air regulator (C) and the bleed-type master air valves (B, E).
2. Close the fluid drain valve (H). Open the fluid shutoff valve (J).
3. Hold the dispense valve (X) firmly to a grounded metal container, and open the valve.
4. Connect the air supply line to the pump air inlet (D).
5. Open the bleed-type master air valves (B, E).
6. Slowly open the air regulator (C) until the pump starts to cycle. Allow the pump to cycle slowly until all air is pushed out of the lines and pump is primed.
7. Adjust the air regulator. Always use the lowest air pressure necessary to get the desired results.

## Pump Shutdown



At the end of the work shift and before you check, adjust, clean or repair the system, follow **Pressure Relief Procedure**, page 15.



# Maintenance

## Maintenance Schedule

Establish a preventive maintenance schedule, based on the pump's service history. Scheduled maintenance is especially important to prevent spills or leakage due to diaphragm failure.

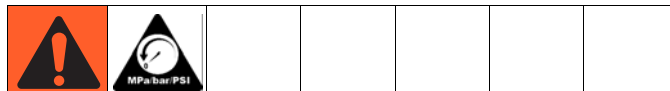
## Lubrication

The pump is lubricated at the factory. It is designed to require no further lubrication for the life of the pump. There is no need to add an in-line lubricator under normal operating conditions.

## Tighten Threaded Connections

Before each use, check all hoses for wear or damage and replace as necessary. Check to be sure all threaded connections are tight and leak-free. Check fasteners. Tighten or retorque as necessary. Although pump use varies, a general guideline is to retorque fasteners every two months. See **Torque Instructions**, page 18.

## Flushing and Storage



- Flush before fluid can dry in the equipment, at the end of the day, before storing, and before repairing equipment.
- Flush at the lowest pressure possible. Check connectors for leaks and tighten as necessary.
- Flush with a fluid that is compatible with the fluid being dispensed and the equipment wetted parts.

Flush the pump often enough to prevent the fluid you are pumping from drying or freezing in the pump and damaging it. Use a compatible solvent.

Always flush the pump and relieve the pressure before storing it for any length of time.

## Torque Instructions

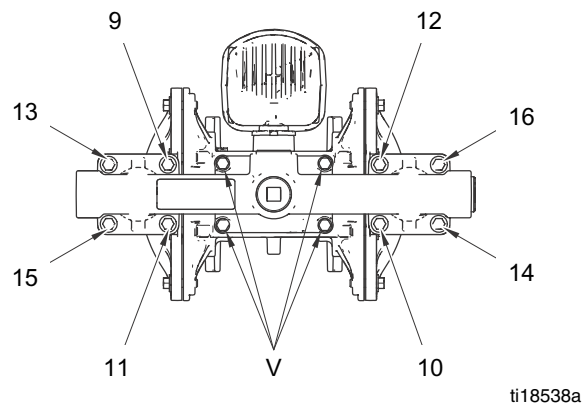
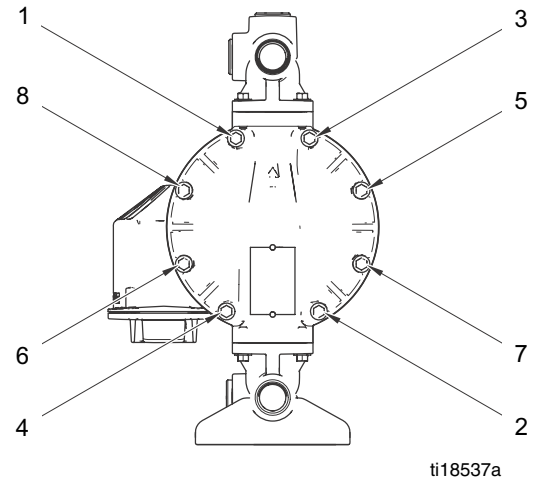
**NOTE:** Fluid cover and manifold fasteners have a thread-locking adhesive patch applied to the threads. If this patch is excessively worn, the fasteners may loosen during operation. Replace screws with new ones or apply medium-strength (blue) Loctite or equivalent to the threads.

If fluid cover or manifold fasteners have been loosened, it is important to torque them using the following procedure to improve sealing.

**NOTE:** Always completely torque fluid covers before torquing manifolds.

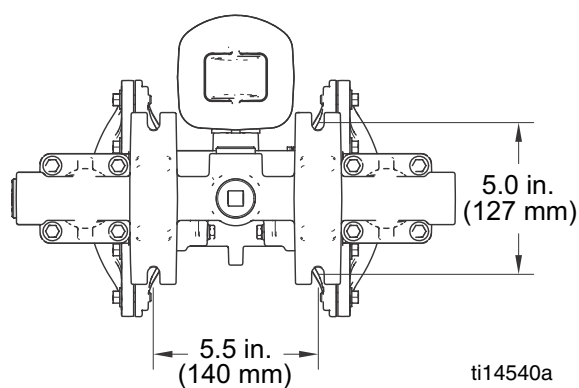
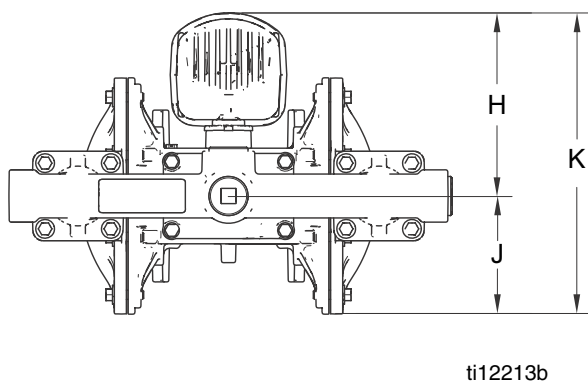
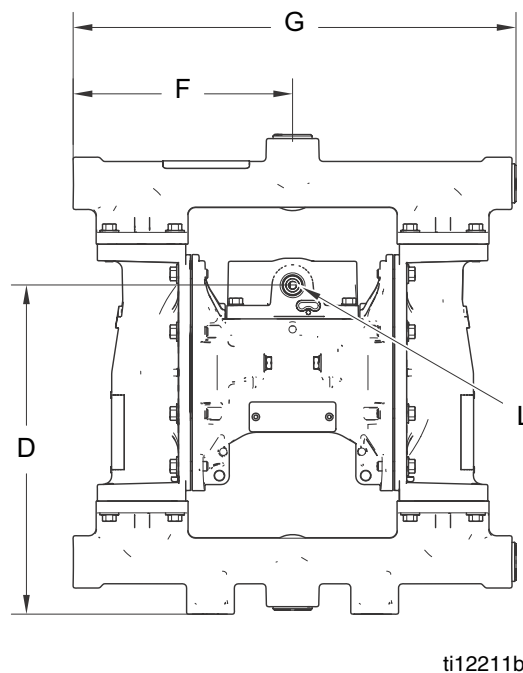
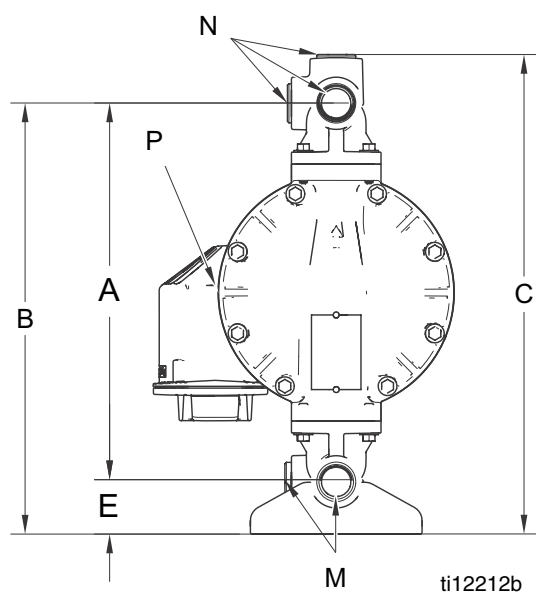
Start all fluid cover screws a few turns. Then turn down each screw just until head contacts cover. Then turn each screw by 1/2 turn or less working in a crisscross pattern until each screw is torqued to 100 in-lb (11.3 N•m). Repeat for manifolds. See FIG. 7.

Retorque the air valve fasteners (V) in a crisscross pattern, to 80 in-lb (9.0 N•m).



**FIG. 7. Torque sequence**

# Dimensions

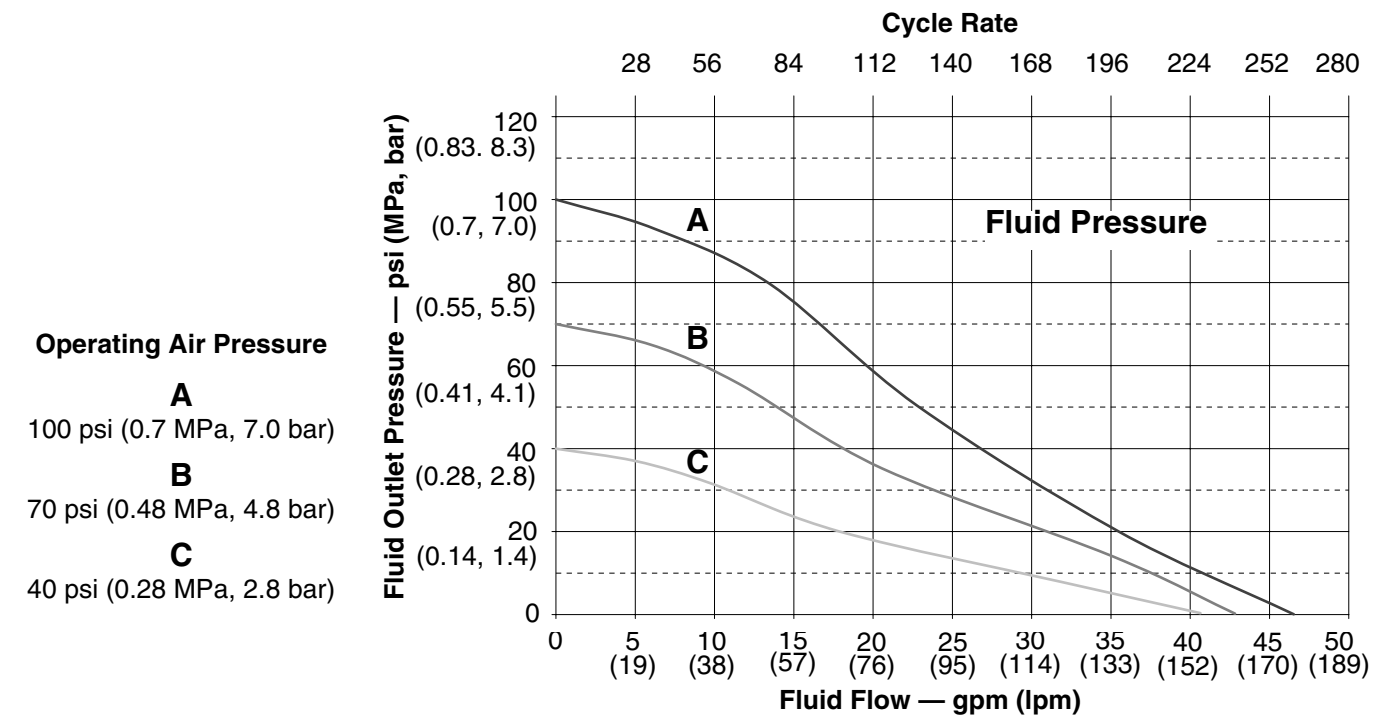


- A** ..... 12.7 in. (323 mm)
- B** ..... 14.4 in. (366 mm)
- C** ..... 15.9 in. (404 mm)
- D** ..... 10.9 in. (277 mm)
- E** ..... 1.8 in. (46 mm)
- F** ..... 7.3 in. (185 mm)
- G** ..... 14.7 in. (373 mm)
- H** ..... 6.2 in. (158 mm)
- J** ..... 3.9 in. (99 mm)

- K** ..... 10.2 in. (258 mm)
- L** ..... 1/2 npt(f) air inlet
- M** ..... 1 in. npt(f) fluid inlet ports (4)
- N** ..... 1 in. npt(f) fluid outlet ports (4)
- P** ..... 3/4 npt(f) air exhaust port

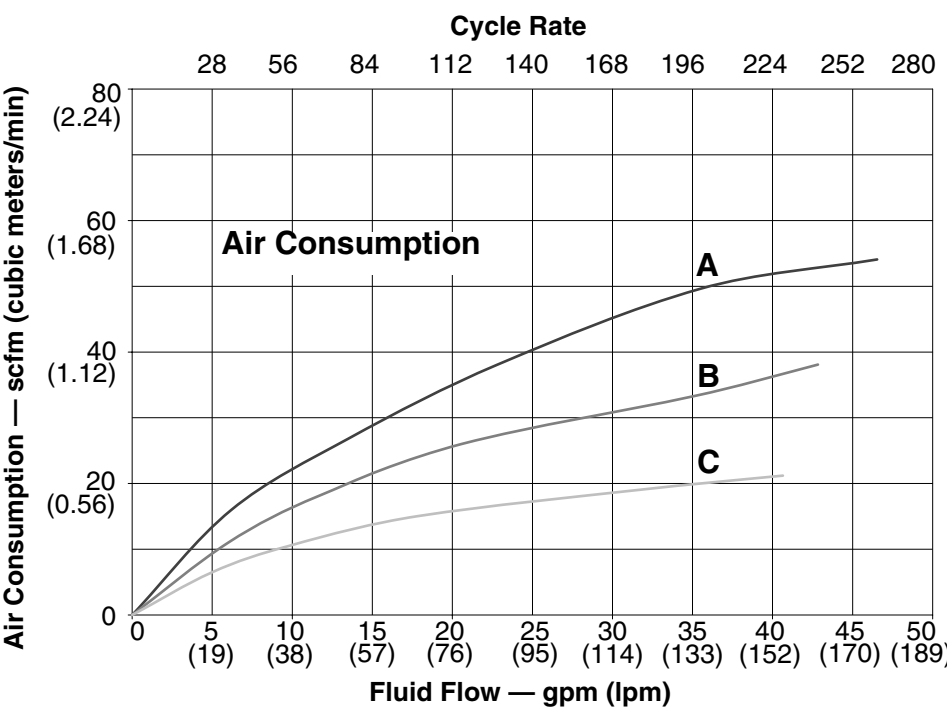
# Performance Chart

**Test Conditions:** Pump tested in water with inlet submerged.



## How to Read the Charts

1. Locate fluid flow rate along bottom of chart.
2. Follow vertical line up to intersection with selected operating air pressure curve.
3. Follow left to scale to read **fluid outlet pressure** (top chart) or **air consumption** (bottom chart).



# Technical Data

Maximum fluid working pressure	
Transfer Pump . . . . .	100 psi (0.7 MPa, 7.0 bar)
Fuel Dispense Pump . . . . .	50 psi (0.35 MPa, 3.5 bar)
Air pressure operating range	
Transfer Pump . . . . .	20-100 psi (0.14-0.7 MPa, 1.4-7.0 bar)
Fuel Dispense Pump . . . . .	20-50 psi (0.14-0.35 MPa, 1.4-3.5 bar)
Air consumption at 70 psi (0.48 MPa, 4.8 bar), 20 gpm (76 lpm) . . . . .	25 scfm
Air consumption at 50 psi (0.35 MPa, 3.5 bar), full flow . . . . .	25 scfm
Fluid displacement per cycle . . . . .	0.17 gal. (0.64 liters)
Maximum values with water as media under submerged inlet conditions at ambient temperature:	
Maximum air consumption . . . . .	64 scfm
Maximum free-flow delivery	
Transfer Pump . . . . .	50 gpm (189 lpm)
Fuel Dispense Pump . . . . .	38 gpm (144 lpm)
Maximum pump speed	
Transfer Pump . . . . .	275 cpm
Fuel Dispense Pump . . . . .	210 cpm
Maximum suction lift (varies widely based on ball/seat selection and wear, operating speed, material properties, and other variables) . . . . .	16 ft (4.9 m) dry, 29 ft (8.8 m) wet
Maximum size pumpable solids . . . . .	1/8 in. (3.2 mm)
Recommended cycle rate for continuous use . . . . .	93 - 140 cpm
Recommended cycle rate for circulation systems . . . . .	20 cpm
Sound Power*	
at 70 psi (0.48 MPa, 4.8 bar) and 50 cpm . . . . .	78 dBa
at 100 psi (0.7 MPa, 7.0 bar) and full flow . . . . .	90 dBa
Sound Pressure**	
at 70 psi (0.48 MPa, 4.8 bar) and 50 cpm . . . . .	84 dBa
at 100 psi (0.7 MPa, 7.0 bar) and full flow . . . . .	96 dBa
Operating temperature range . . . . .	10°F-150°F (-12°C-65°C)
Air inlet size . . . . .	1/2 npt(f)
Fluid inlet size . . . . .	1 in. npt(f)
Fluid outlet size . . . . .	1 in. npt(f)
Weight . . . . .	23 lb. (10.5 kg)
Wetted parts . . . . .	aluminum, TPC-ET, Acetal, PTFE
Non-wetted external parts . . . . .	aluminum, coated carbon steel

\* Sound power measured per ISO-9614-2.

\*\* Sound pressure was tested 3.28 ft (1 m) from equipment.

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Original instructions. This manual contains English. MM 313597

**Graco Headquarters:** Minneapolis  
**International Offices:** Belgium, China, Japan, Korea

**GRACO INC. AND SUBSIDIARIES • P.O. BOX 1441 • MINNEAPOLIS MN 55440-1441 • USA**

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Revised 01/2012